

**Work Order ID 60702**

Monday, July 19, 2010 2:49:52 PM



Page 1

Item ID: D205-634-041

Accept



Setup Start

Revision ID:

Item Name: Replacement Skidtube

Stop

Start Date: 7/19/2010 Start Qty: 1.00



Required Date: 8/5/2010 Req'd Qty: 1.00



Cust Item ID:

Customer:

Reference:

Approvals: Process Plan: 

Date: 10-7-19 Tooling:

Date:

Run Start

QC:

Date: SPC (Y/N):

Date:

Stop

Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run Hours

Tool ID

Tool #

Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

Draw Nbr

Revision Nbr

D2580

Rev D

100

0.00



DOCUMENT CONTROL

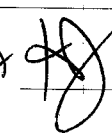
DC

Memo

0.00

Document Control

Photocopy D205-634 bluefile &amp; type labels per PPP D205-634-041 CHG002

N/A 

110

0.00



BENDING MACHINE - SKIDTUBES

CNC Bend 1

Memo

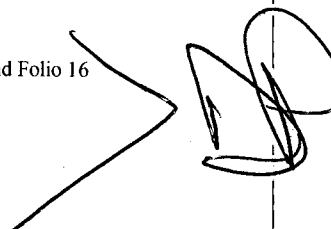
0.00

CNC Delta 100 Bender

1-Bend as per program D2580.C on CNC Bender and Folio 16

2-Cut tubes as per Dwg. D2580

3- scribe batch# in aft end of tube



10-7-22

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

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QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Run Start



Stop

Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run Hours

Tool ID

Tool # Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

120

0.00



Skidtubes

Memo

0.00

Skidtubes

1- Deburr ends

2- C'sink holes as per dwg without cutting fluid

3- Prepare tube for welding, remove alodine as required.

4- Scribe batch number insied aft end of tube.

130

QC5- Inspect part completeness to step on W/O

0.00



QC

Memo

0.00

Quality Control

S 10/07/26



1 - AWM 10-07-22

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Process Plan:

Date:

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run Hours

Tool ID

Tool # Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

140

0.00



Skidtubes

Memo

0.00

Skidtubes

1-Weld step D2576 as per Dwg. D2580 and QSI 004

A/R□□□ Aluminum Rod

m114242

BE

10/07/26

2-Prep per QSI 005 and weld crossbolt spacers D2579 as per Dwg. D2580, QSI 004.

For D2579 spacers, weld one side, pass 3/8" drill, weld other side, pass 3/8" drill

A/R□□□ Aluminum Rod

m114242

BE 10/07/26

3-Grind welds as per Dwg D2580 Grind flush ridge made from bending

4-Drill holes for wearplates using DT 8217 &amp; DT8937 Open holes to 19/64", adjust stopper not to hit web. Debur

5-Counterbore crossbolt spacers to 7/16" ID x 1.0" deep as per Dwg D2580. Debur holes

6-Drill pilot holes for aft cap using DT 8215 Open holes to 0.208". Debur

7-Drill pilot holes for Tow ring using DT8091, open to .640" and Debur

D10-7-27

**Dart Aerospace Ltd**

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Tooling:

Date:

Run

Start



QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run Hours

Tool ID

Tool #

Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

150

QC10- Inspect visual per QSI004- ground welds

0.00

S 10/07/28



QC

Memo

0.00

Quality Control

160

QC5- Inspect part completeness to step on W/O

0.00

S 10/07/28



QC

Memo

0.00

Quality Control

(H)

170

Pressure Wash per QSI005 4.3

0.00



HandFinish

Memo

0.00

Hand Finishing

Re-alodine tube as per QSI 005 section 4.1.2.1 do not acid etch and leave fwd cap out of solution.

S

10/07/28

1

S

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Reference:

Approvals:

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Date:

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run Hours

Tool ID

Tool #

Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

180

White Gloss(Ref:4.3.5.1) per QSI005 4.3-Alum

0.00



Powdercoat

*M114841*

Memo

0.00

Powder Coating

START TIME:

OVEN TEMPERATURE:

FINISH TIME:

*8:10  
300°  
8:40**① BR 10-7-29*

190

QC3- Inspect Part Finish

0.00

*=) M 10/07/29*

QC

Memo

0.00

Quality Control

*1*

W/O:		WORK ORDER CHANGES					
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Required Date: 8/5/2010 Req'd Qty: 1.00



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Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run Hours

Tool ID

Tool #

Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

200

0.00



HandFinish

Memo

0.00

Hand Finishing

=) JU

10/07/29

1

1-Install inserts &amp; wearplates &amp; Gaskets as per Dwg. D2580. Use a drop of

Sikaflex on insert holes before installing wearplates

A/R ☐ ☐ ☐ Sikaflex-291 ☐ M115114 ☐ ☐

Sikaflex expire date: 11/06

2-Coat D2594-3 O' rings with Petroleum Jelly and install on D2594-1 plugs as per Dwg D2580

3-Inspect for foreign object per QSI 024

4-Install 2855 Aft Cap as per Dwg D2580 and seal Fwd Step &amp; Aft Cap with Sikaflex. Clean excess adhesive

A/R ☐ ☐ ☐ Sikaflex-291 ☐ M115114 ☐ ☐

Sikaflex expire date: 11/06

5-Wing Walk as per Dwg D2580 and QSI 005 4.4

Batch: A115028

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Required Date: 8/5/2010 Req'd Qty: 1.00

Reference:

Cust Item ID:

Customer:

Approvals:

Process Plan:

Date:

Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Run

Start

Stop

Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run Hours

Tool ID

Tool #

Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

210



QC

Quality Control

QC5- Inspect part completeness to step on W/O

0.00

Memo

Inspect Aft Cap, Fwd Step and Wing Walk of work to Current Step Inspect for Foreign objects per QSI 024

0.00

S 10/07/29

40

220



Packaging

Packaging

Packaging

0.00

Memo

Identify and pack for shipping as per PPPD205-634-041

Location:

PPP Rev:

0.00

PPP

606910

10/7/2010

230



QC

Quality Control

QC21- Final Inspection - Work Order Release

0.00

Memo

0.00

10/08/03

10-7-30  
①

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

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Page 1

Work Order ID: 60702

Parent Item: D205-634-041

Parent Item Name: Replacement Skidtube

Start Date: 7/19/2010

Required Date: 8/5/2010

Start Qty: 1.00

Required Qty: 1.00

## Comments:

IPP Rev:N 02.08.28 FP was QC5 in Step 27; Added QC5 to Step 30 KJ  
 IPP Rev P 10.02.19 per PAR09-043 EC verified by:DD  
 IPP Rev. O 06.02.28 Added paperwork EC  
 IPP Rev:P 07-07-09 SS Wearplates & Gaskets JLM

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
---------------------------------	------------------------	---------------	-------------	---------------------	------------------	-----------------	--------------------	----------------	-------------	--------------	---------------	----------------	--------

D2580-1		Manufactured	No			110	Each	6.0000	1	1			
---------	--	--------------	----	--	--	-----	------	--------	---	---	--	--	--



205 Skidtube bent detail

### Location

### Loc Qty

LG	4
57028	1
59297	1
60379	2
ST046	2
59913	2

### Loc Code

DP 10-7-22

D2576-3



Step (maching detail)

Manufactured	No			140	Each	90.0000	1	1				
--------------	----	--	--	-----	------	---------	---	---	--	--	--	--

### Location

### Loc Qty

LG	90
46661	42
52215	48

### Loc Code

BE 10/07/26

D2579



Crossbolt Spacer

Manufactured	No			140	Each	313.0000	20	20				
--------------	----	--	--	-----	------	----------	----	----	--	--	--	--

### Location

### Loc Qty

LG	313
57052	5
57348	4
58433	14
59113	290

### Loc Code

BE 10/07/26

W/O:		WORK ORDER CHANGES					
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Page 2

Work Order ID: 60702

Parent Item: D205-634-041

Parent Item Name: Replacement Skidtube

D2855 Manufactured No 200 Each



Cap

Location	Loc Qty
----------	---------

FP6	1
56613	1
ST026	82
50513	1
50770	28
51539	2
53791	51

AN3-5A Purchased No



Bolt

Location	Loc Qty
----------	---------

ST350	1128
05057	628
115016	500

AN960JD10L NAS1149D0332J Purchased No



Washer

Location	Loc Qty
----------	---------

ST348	3077
10985	3077

Start Date: 7/19/2010

Required Date: 8/5/2010

Start Qty: 1.00

Required Qty: 1.00

83.0000 1 1



Loc Code

1,128.000 2 2



Loc Code

3,077.000 2 2



Loc Code

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Shop Packet Print

Page 2

W/O:		WORK ORDER CHANGES					
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Parent Item Name: Replacement Skidtube

ALS7-1032-130

Purchased

No

200

Each

950.0000

50

50



Insert

## Location

## Loc Qty

FP	933
115079	933
ST282	17
113238	17

## Loc Code

M114723 x50 JH 10/07/29

AN3C4A

Purchased

No

200

Each

1,533.000

50

50



BOLT

## Location

## Loc Qty

ST350	1533
114103	501
114108	14
114416	12
114523	2
114859	4
114941	1000

## Loc Code

x50 JH 10/07/29

AN960C10L

NAS1149C0332

Purchased

No

200

Each

0.0000

50

50



washer

D3566-13

Manufactured

No

200

Each

36.0000

1

1



Gasket

M115000

x50 JH 10/07/29

## Location

## Loc Qty

FP	5
53461	5
FP012	31
59661	23
60209	8

## Loc Code

x1 JH 10/07/29

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Start Date: 7/19/2010

Required Date: 8/5/2010

Start Qty: 1.00

Required Qty: 1.00

D3566-5  
Gasket  
Manufactured No 200 Each 17.0000 1 1

Location

Loc Qty

Loc Code

FP015

17

59158

17

D3566-1  
Gasket  
Manufactured No 200 Each 23.0000 2 2

Location

Loc Qty

Loc Code

FP015

23

57715

2

59126

9

60202

12

D3564-11  
Wearshoe  
Manufactured No 200 Each 10.0000 1 1

Location

Loc Qty

Loc Code

FP019

10

59941

10

D3564-13  
Wearshoe  
Manufactured No 200 Each 20.0000 1 1

Location

Loc Qty

Loc Code

FP17

20

57922

1

59660

19

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Parent Item: D205-634-041

Parent Item Name: Replacement Skidtube

D3564-9



Wearshoe

Manufactured No

200

Each

Start Date: 7/19/2010

Required Date: 8/5/2010

Start Qty: 1.00

Required Qty: 1.00

13.0000

1

1



## Location

## Loc Qty

## Loc Code

FP

1

55334

1

FP019

12

12

59201

200

Each

17.0000

1

1



X1 10/07/29

D3564-5



Wearshoe

Manufactured No

## Location

## Loc Qty

## Loc Code

FG

1

34806

1

FP19

5

57525

1

58709

4

FP-19

11

11

59157

200

Each

443.0000

16

16



X1 10/07/29

D2594-3



O-Ring, 205 Skidtube

Manufactured No

## Location

## Loc Qty

## Loc Code

FP

443

55546

19

58191

12

59358

412

X16 10/07/29

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# Picklist Print

Monday, July 19, 2010 2:49:56 PM

Page 6

Work Order ID: 60702

Parent Item: D205-634-041

Parent Item Name: Replacement Skidtube



D2594-1

Manufactured No

200

Each

451.0000

16

16

Start Date: 7/19/2010

Required Date: 8/5/2010

Start Qty: 1.00

Required Qty: 1.00



Plug, 205 Skidtube

## Location

## Loc Qty

## Loc Code

FP		183
42807		112
55002		71
FP14		268
58434		79
59110		189



x16 ul 10/02/29

Monday, July 19, 2010 2:49:56 PM

Shop Packet Print

Page 6

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

**DART****RELEASED**  
07-06-28 #

DESIGN #	DRAWN BY RH	<b>DART AEROSPACE LTD</b> HAWKESBURY, ONTARIO, CANADA	
CHECKED #	APPROVED #	DRAWING NO. D2580	REV. D SHEET 1 OF 3
DATE 07.02.27		TITLE 205 SKIDTUBE ASSEMBLY	SCALE NTS
A	96.09.16	NEW ISSUE	
B	96.12.02	AS MANUFACTURED	
C	98.08.26	REDRAWN, INCLUDED DEO 9094/9097	
D	07.02.27	CHANGE TO SS WEARPLATES AND GASKETS, INCLUDE DEO 9124/9183	

QTY -041	QTY -045	Part Number	Description
X		D2580-041	SKIDTUBE ASSEMBLY
	X	D2580-045	SKIDTUBE ASSEMBLY
1	1	D2500-1-190	EXTRUSION
1	1	D2576-3	STEP
20	24	D2579	CROSS BOLT SPACER
16	16	D2594-1	PLUG
16	16	D2594-3	O-RING
1	1	D2596	205 WEB
1	1	D2855	AFT CAP
1	1	D3564-5	WEARSHOE
1	1	D3564-9	WEARSHOE
1	1	D3564-11	WEARSHOE
1	1	D3564-13	WEARSHOE
2	2	D3566-1	GASKET
1	1	D3566-5	GASKET
1	1	D3566-13	GASKET
50	50	ALS7-1032-130 or AKS7-1032-130 or AKS4-1032-130 or AELS-1032-130	INSERT
50	50	AN3C4A	BOLT
2	2	AN3-5A	BOLT
50	50	AN960C10L	WASHER
2	2	AN960JD10L	WASHER

SHOP COPY  
RETURN TO  
ENGINEERING  
UNCONTROLLED COPY  
SUBJECT TO AMENDMENT  
WITHOUT NOTICE  
WORK ORDER  
NO. 60202

BS-0-7-19

**GENERAL NOTES:**

- 1) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- 2) ALL DIMENSIONS ARE IN INCHES
- 3) INSERT D2596 WEB TO LOCATION SHOWN OFF AFT END OF SKIDTUBE AND BOND WEB INTO OUTER TUBE WITH NON-STRUCTURAL SIKAFLEX-241 ADHESIVE PER DART QSI 015 BEFORE BENDING. ENSURE HOLES LINE-UP.
- 4) BEND AS A SMOOTH RADIUS STARTING WITH A MAXIMUM CENTERLINE RADIUS OF 60 AND ENDING WITH A MINIMUM RADIUS OF 30. A MAXIMUM REDUCTION OF 0.200 IN DIAMETER IS ALLOWABLE IN THE BENT PORTION OF THE TUBE.
- 5) USE DART DRILL TEMPLATE TD2577-205 TO LOCATE AND DRILL Ø.297 HOLES FOR WEARSHOE INSERTS. INSTALL ALS7-1032-130 PER SECTION D-D (50 PLACES) AFTER FINISH. INSTALL AN3C4A BOLTS AND AN960C10L WASHERS WITH SIKAFLEX-241/-291.
- 6) WELDING TO BE DONE PER DART QSI 004.
- 7) FINISH:  
SEE NOTES ON  
PAGE 2 FOR D2580-041 AND  
PAGE 3 FOR D2580-045
- 8) INSERT D2594-1 PLUG C/W D2594-3 O-RING IN HOLES MARKED 'P' (BOTH SIDES OF TUBE) AFTER FINISH (16 PLACES).

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W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries



W/O:		WORK ORDER CHANGES							
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector		

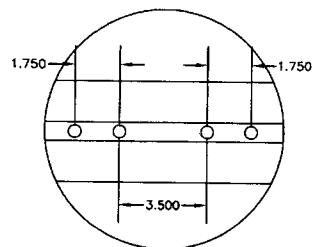
Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

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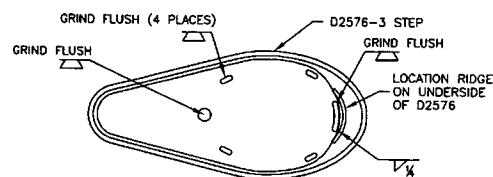
**NOTE:** Date & initial all entries

DETAIL E  
SCALE 5:24

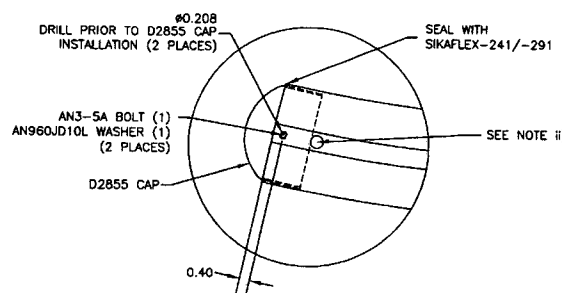


RELEASED  
07 Dec 88

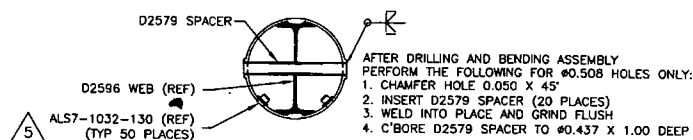
DETAIL F  
SCALE 5:24



DETAIL G  
SCALE 5:24



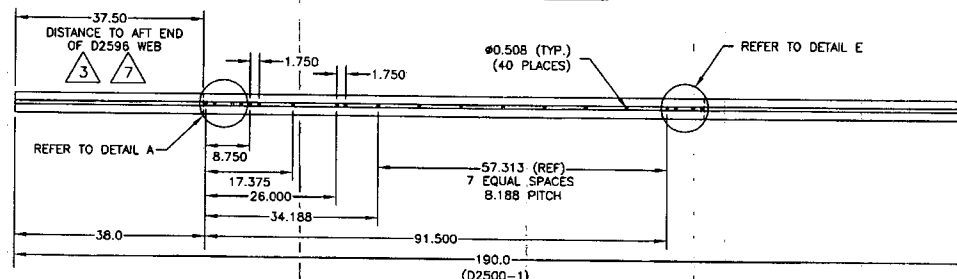
SECTION H-H  
SCALE 5:24



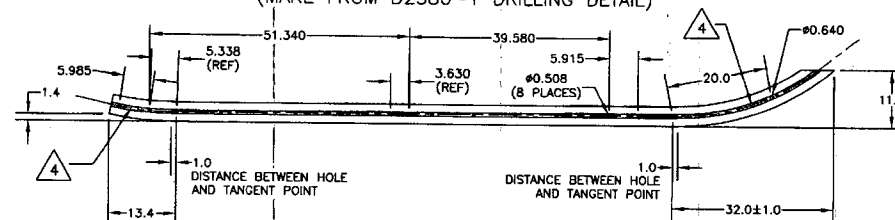
# D2580-045 NOTES

- i) FINISH: ACID ETCH, ALODINE PER DART QSI 005 4.1 PRIOR TO INSERTING D2596 WEB  
POWDER COAT ENTIRE ASSEMBLY GREEN (REF. 4.3.5.8) PER DART QSI 005 4.3  
BLACK ANTI-SKID PAINT AS INDICATED PER DART QSI 005 4.4
- ii) IT IS ACCEPTABLE TO GRIND A RELIEF IN THE D2855 AFT CAP TO PREVENT INTERFERENCE  
WITH THE SPACER AT THIS LOCATION

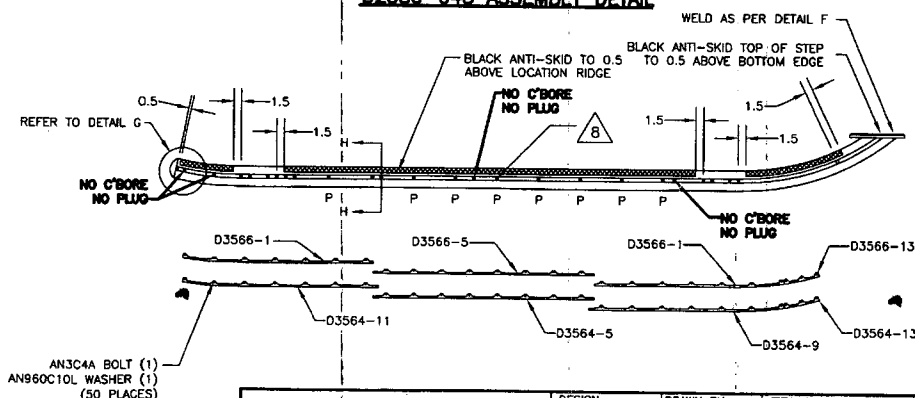
## D2580-1 DRILLING DETAIL



## D2580-5 BENDING AND CUTTING DETAIL (MAKE FROM D2580-1 DRILLING DETAIL)



## D2580-045 ASSEMBLY DETAIL



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DESIGN RH	DRAWN BY RH	<b>DART</b>	DART AEROSPACE LTD. HAWKESBURY, ONTARIO, CANADA
CHECKED H	APPROVED H	DRAWING NO. D2580	REV. D
DATE 07.02.27	TITLE 205 SKIDTUBE ASSEMBLY	SHEET 3 OF 3	SCALE 1:24

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

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**NOTE:** Date & initial all entries



NO. 232

AWS D17.1.2001  
QUALIFICATION TEST RECORD

Name: Baclay Elliott  
Job number: 59105  
Part number: D205-634-041  
Description: 205 skid tube  
Welding Process: Tig[☒] Mig[ ]  
Base material: Aluminium  
Current: AC[☒] DC[ ]

TEST REQUIREMENTS AND RESULTS

Visual: pass[☒] fail[ ]  
Penetration: pass[☒] fail[ ]

UNACCEPTABLE

Cracks: pass[☒] fail[ ]  
Undercut: pass[☒] fail[ ]  
Pin holes: pass[☒] fail[ ]  
Overlap (cold lap): pass[☒] fail[ ]  
Porosity (surface): pass[☒] fail[ ]  
Coloration: pass[☒] fail[ ]

Qualifier Pat. Dunn Date of Test Coupon 10.06.01  
Welder Baclay Elliott Date of Test Coupon 10.06.01

The above named individual is qualified in accordance with AWS D17.1.2001 to weld